# Complete Summary

## GUIDELINE TITLE

Neurologic complications in HIV-infected children and adolescents.

## BIBLIOGRAPHIC SOURCE(S)

New York State Department of Health. Neurologic complications in HIV-infected children and adolescents. New York (NY): New York State Department of Health; 2003 Mar. 19 p. [19 references]

## GUIDELINE STATUS

This is the current release of the guideline.

## COMPLETE SUMMARY CONTENT



## SCOPE

### DISEASE/CONDITION(S)

- Human immunodeficiency virus (HIV) infection
- Neurological complications of HIV, including:
  - HIV encephalopathy
  - Infections of the central nervous system (CNS) including:
    - Cryptococcus neoformans infection
    - Toxoplasma gondii infection
    - Herpes virus infection (herpes simplex, varicella zoster, cytomegalovirus infection)
    - JC virus infection
    - Bacterial meningitis
    - Syphilis (Treponema pallidum infection)
    - Mycobacteria infection
- Primary central nervous system lymphoma
- Antiretroviral toxicities

- HIV-related neuropathy/myopathy/myelopathy
- Seizures
- Stroke

## GUIDELINE CATEGORY

Diagnosis
Evaluation
Management
Screening
Treatment

## CLINICAL SPECIALTY

Allergy and Immunology
Family Practice
Hematology
Infectious Diseases
Neurology
Pediatrics

## INTENDED USERS

Health Care Providers
Physician Assistants
Physicians
Public Health Departments

## GUIDELINE OBJECTIVE(S)

To develop guidelines for management of neurological complications in human immunodeficiency virus (HIV)-infected children and adolescents

## TARGET POPULATION

Human immunodeficiency virus (HIV)-infected children and adolescents

## INTERVENTIONS AND PRACTICES CONSIDERED

### Evaluation/Diagnosis

1. Neurological evaluations for children with developmental delay or neurological signs and symptoms
2. Routine ophthalmologic evaluation, including yearly retinal exam
3. Blood testing (complete blood count [CBC], blood culture, electrolytes, toxicology screen, toxoplasmosis serum antibody, cryptococcal antigen and culture)
4. Lumbar puncture and cerebrospinal fluid testing, including:
    - Opening pressure
    - Gram stain
    - Cell count

- Protein
- Glucose
- Bacterial culture
- Cryptococcal antigen and culture
- Polymerase chain reaction (PCR) for Epstein-Barr virus (EBV), cytomegalovirus (CMV), varicella zoster virus (VZV), and herpes simplex virus (HSV)
- Viral, fungal, and mycobacterial cultures
- Venereal Disease Research Laboratory (VDRL) test for syphilis

5. Imaging studies, including computed tomography (CT) scan, magnetic resonance imaging (MRI)
6. Electromyogram
7. Electroencephalogram (EEG)
8. Nerve conduction studies
9. Nerve and muscle biopsy

Treatment/Management

Human Immunodeficiency Virus (HIV) Encephalopathy

Antiretroviral drugs (highly active antiretroviral therapy [HAART])

Cryptococcosis

1. Amphotericin B intravenously or liposomal amphotericin
2. 5-fluorocysoine
3. Fluconazole

Toxoplasmosis

1. Sulfadiazine + pyrimethamine +folinic acid
2. Clindamycin + pyrimethamine + folinic acid

Herpes Simplex Virus and Varicella Zoster Virus Infection

Acyclovir

Cytomegalovirus Infection

1. Ganciclovir
2. Foscarnet
3. Routine retinal examinations

JC Virus Infection

Antiretroviral drugs (highly active antiretroviral therapy [HAART])

Bacterial Meningitis

1. Vancomycin and ceftriaxone as empiric treatment of community-acquired bacterial meningitis

2. Modification of therapy as needed based on specific microbial organism identified
3. Hearing tests (audiogram, auditory evoked response)
4. Daily monitoring of neurological status

Syphilis

Treatment according to stage of syphilis, whether or not it is congenital, whether it is neurosyphilis, and pregnancy status of patient

Mycobacterium Tuberculosis and Atypical Mycobacterium Infection

Immediate treatment upon recognition of a positive smear using standard therapy for mycobacteria infections

Primary Central Nervous System (CNS) Lymphoma

1. CNS radiation
2. Oral prednisone

Antiretroviral Toxicity

Discontinuation of offending drug and replacement with another drug

HIV-related Neuropathy/Myopathy/Myelopathy

1. Prednisone
2. Intravenous immunoglobulin
3. Plasmapheresis
4. Antiretroviral therapy (discontinuation and replacement if drug-related pathology)

Seizures

Referral to neurologist for seizure management

Stroke

1. Specialty consultation and treatment
2. Treatment of increased intracranial pressure as necessary

### MAJOR OUTCOMES CONSIDERED

Not stated

## METHODOLOGY

### METHODS USED TO COLLECT/SELECT EVIDENCE

Hand-searches of Published Literature (Primary Sources)
Hand-searches of Published Literature (Secondary Sources)
Searches of Electronic Databases

## DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

Not stated

## NUMBER OF SOURCE DOCUMENTS

Not stated

## METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Expert Consensus (Committee)

## RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Not applicable

## METHODS USED TO ANALYZE THE EVIDENCE

Review

## DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Not applicable

## METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus

## DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

The Human Immunodeficiency Virus (HIV) Guidelines Program works directly with committees composed of HIV Specialists to develop clinical practice guidelines. These specialists represent different disciplines associated with HIV care, including infectious diseases, family medicine, obstetrics and gynecology, among others. Generally, committees meet in person 3 to 4 times per year, and otherwise conduct business through monthly conference calls.

Committees meet to determine priorities of content, review literature, and weigh evidence for a given topic. These discussions are followed by careful deliberation to craft recommendations that can guide HIV primary care practitioners in the delivery of HIV care. Decision making occurs by consensus. When sufficient evidence is unavailable to support a specific recommendation that addresses an important component of HIV care, the group relies on their collective best practice experience to develop the final statement. The text is then drafted by one

member, reviewed and modified by the committee, edited by medical writers, and then submitted for peer review.

### RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Not applicable

### COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

### METHOD OF GUIDELINE VALIDATION

Peer Review

### DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

Not stated

## RECOMMENDATIONS

### MAJOR RECOMMENDATIONS

#### Baseline Neurologic Evaluation

At routine visits, the primary care physician should be particularly vigilant for the appearance of the following conditions:

- Developmental delay or loss of previously acquired milestones
- Microcephaly/deceleration in head growth
- Abnormal tone and reflexes (especially clonus and cross adductor reflex)
- Focal findings
- Speech and language delay

A baseline neurological consultation should be obtained for all children with developmental delay or neurological signs and symptoms (e.g., focal weakness, seizures, altered mental status, or microcephaly) and for any human immunodeficiency virus (HIV)-infected child with a high viral load (>100,000 copies/mL) at baseline.

The neurologic specialist should discuss correlation and interpretation of neurologic examination and diagnostic studies with the primary care physician.

A routine ophthalmologic evaluation, including a yearly retinal examination, should be performed in all HIV-infected children. Clinicians should be aware that HIV-infected children with significant immune suppression are at risk for ocular infections, including cytomegalovirus (CMV) retinitis, toxoplasmosis, and herpes infections.

The necessity and timing of further evaluations should be determined by the following:

- Severity of neurologic involvement at the time of initial assessment
- Value of repeated neurologic examinations in terms of available therapeutic intervention and prognostic measures
- Appearance of new neurologic symptoms

Children with well-controlled HIV disease and isolated developmental delays without other neurologic findings should be reassessed 3 months after detection of the delay. If there is no change in neurologic examination and development is proceeding, follow-up should occur according to routine neurological care practice.

## Specific Complications

### HIV Encephalopathy

HIV should be considered in any child with progressive neurological deterioration who has not been previously tested for HIV or who might have it despite a previous negative test.

#### Treatment

HIV encephalopathy should be treated with the same antiretroviral (ARV) agents used to treat symptomatic HIV disease, with the goal of achieving low to undetectable viral load and reversal of immune suppression.

HIV-infected children with neurologic impairments and developmental delays should be referred to early intervention programs.

### Infections of the Central Nervous System

A pediatric HIV Specialist should be consulted whenever a central nervous system infection is suspected.

Various etiologic agents should be excluded via lumbar puncture and cerebrospinal fluid (CSF) testing, unless contraindicated (see Table 1 in the original guideline document).

#### Cryptococcus neoformans

##### Diagnosis

Isolation of Cryptococcus neoformans by culture, serum, and CSF cryptococcal antigen test, or histologic examination of tissue specimens should be performed to obtain a definitive diagnosis.

Cryptococcal meningitis should be considered in any HIV-infected patient who has new neurologic findings and should be excluded by lumbar puncture.

Treatment

Treatment for cryptococcosis should be initiated if the organism is identified by stain or by increased levels of cryptococcal antigen (see standard and alternative regimens below). Waiting for culture results is not advisable before initiating therapy because it may take days or weeks to grow.

Cryptococcal meningitis should be treated with amphotericin B (with or without flucytosine) or fluconazole depending on severity of disease and immune suppression (see below for standard and alternative drug regimens for treatment of cryptococcosis).

Therapeutic lumbar punctures should be used to control symptoms of increased intracranial pressure secondary to communicating hydrocephalus caused by cryptococcal meningitis.

Because HIV-infected patients cannot be cured of cryptococcosis, most patients should be maintained on lifelong chronic therapy.

Standard Regimen for Cryptococcosis

Amphotericin B intravenously (0.7-1.0 mg/kg per day of the standard preparation or liposomal amphotericin 3-5 mg/kg per day) in one daily dose for 2 weeks or until clinically stable

with or without

5-fluorocytosine (100-150 mg/kg per day orally [po]), divided into four daily doses for 2 weeks or until clinically stable,

then

Fluconazole (10-20 mg/kg intravenously [IV] or po for 1 day up to 800 mg, then 5-10 mg/kg per day up to 400 mg indefinitely)

Alternative Regimens for Cryptococcosis

For very mild disease:

Fluconazole alone for 6 to 10 weeks

For very severe disease or in severely immune deficient children:

Amphotericin B + 5-fluorocytosine for 6 weeks prior to beginning fluconazole suppression

Clinical and Laboratory Monitoring

The neurologic status of patients with cryptococcosis should be monitored daily.

Lumbar puncture should be repeated within 1 week (sooner if clinically indicated), and cryptococcal antigen level should be monitored. Antigen level should decrease with successful therapy. Opening pressure should be measured at each lumbar puncture.

For patients receiving amphotericin B, complete blood count and tests for electrolytes, blood urea nitrogen (BUN), creatinine, and liver function should be performed at least once weekly to monitor for toxicities and more frequently at the beginning of therapy (see Table 3 in the original guideline document).

For patients receiving 5-fluorocytosine, complete blood count, platelet count, creatinine, and serum liver enzyme levels should be obtained. Serum drug levels should be monitored, if available (see Table 2 in the original guideline document).

A patient with cryptococcosis may be discharged from the hospital when neurologic status, especially intracranial pressure, is stable and adequate arrangements have been made for therapy at home.

After successful therapy for cryptococcal meningitis, the patient should be maintained on lifelong suppressive therapy. Suppressive therapy regimens include daily oral fluconazole or weekly intravenous amphotericin.

Toxoplasma gondii

Diagnosis

If Toxoplasma serology is positive, a child should be treated empirically with pyrimethamine/sulfa for 2 weeks before considering more invasive diagnostic procedures.

If Toxoplasma serology is negative or if CSF Epstein-Barr virus polymerase chain reaction (EBV PCR) is positive, invasive diagnostic procedures, such as a brain biopsy, should be considered to determine the diagnosis. A positive CSF EBV PCR indicates the likelihood of central nervous system (CNS) lymphoma.

If a favorable response to empiric treatment is documented, CNS toxoplasmosis is the presumptive diagnosis. In cases in which no improvement is documented, further invasive diagnostic procedures may be indicated to exclude other opportunistic infections, brain abscess, or tumor.

Treatment

Toxoplasma encephalitis should be treated with one of the regimens listed below for 4 to 6 weeks:

Standard Regimen

Sulfadiazine 120 to 200 mg/kg/day divided into four doses

and

Pyrimethamine [loading dosage of 2 mg/kg per day (max, 100 mg) divided into two doses for 3 days, followed by maintenance dosage of 1 mg/kg per day (max, 25 mg), delivered orally]

and

Folinic acid (1 to 2 mg per day in infants and 5 to 10 mg every 3 days in older children, delivered orally) for patients receiving pyrimethamine

Alternative Regimen*

Clindamycin (40 to 60 mg/kg/day IV divided into 4 doses) plus pyrimethamine plus folinic acid

*The effectiveness of the alternative regimen is unproven in pediatric patients. Acceptable reasons for using the alternative regimen are patient participation in a research protocol and patient inability to tolerate or failure to respond to the standard therapeutic regimen.

Laboratory Monitoring

Close monitoring of patients receiving treatment for toxoplasmosis, including complete blood count (CBC) and serum liver enzymes, is required to detect adverse drug reactions (see Table 5 in the original guideline document for major toxicities that may occur with treatment).

Herpes Virus

Herpes Simplex Virus (HSV)

HSV encephalitis should be treated with acyclovir. Beyond the neonatal period, the dosage is 30 mg/kg/day IV divided into three doses administered every 8 hours for 14 to 21 days. The neonatal dose is 60 mg/kg/day IV divided into three doses administered every 8 hours for 14 to 21 days.

Varicella Zoster Virus

Acyclovir at 1500 mg/$m^2$/day IV divided into three doses administered every 8 hours for 7 to 10 days (or 30 mg/kg/day divided every 8h) should be used to treat varicella zoster virus infection.

Cytomegalovirus

Cytomegalovirus infection may be treated with intravenous ganciclovir (10 mg/kg per day divided into two doses every 12 hours), and maintenance therapy is needed until immune restoration occurs.

For ganciclovir-resistant retinitis, foscarnet should be used (limited data in pediatrics).

Routine retinal examinations should be performed every 6 months in children with severe immunosuppression.

JC Virus

Clinicians should recommend highly active antiretroviral therapy (HAART) for patients with progressive multifocal leukoencephalopathy (PML).

Bacterial Meningitis

Diagnosis

Definitive diagnosis of bacterial meningitis is made by isolating and identifying the organism from CSF or blood culture. Lumbar puncture is needed to make a correct diagnosis.

Treatment

Antimicrobial therapy directed at the most common etiological agents (i.e., Streptococcus pneumoniae, Haemophilus influenzae) should be used to treat bacterial meningitis. Both vancomycin and ceftriaxone at meningitic doses should be used in the empiric treatment of community-acquired bacterial meningitis. Antibiotic choice may be modified once an organism is identified and antimicrobial sensitivities are available. Duration of therapy is usually 10 to 14 days.

Clinical and Laboratory Monitoring

Neurologic status of patients with bacterial meningitis should be monitored daily.

If diagnosis is in doubt, lumbar puncture should be repeated to diagnose bacterial meningitis and to document sterility.

Hearing tests (audiogram, auditory evoked responses) should be performed in patients with bacterial meningitis before discharge and at 6-month follow-up visit after discharge.

Patients with bacterial meningitis may be discharged from the hospital when neurologic status is stable and adequate arrangements have been made for follow-up.

Syphilis (Treponema pallidum)

Diagnosis

Neurosyphilis should be considered in the differential diagnosis of neurologic dysfunction in an HIV-infected patient, regardless of serologic evidence.

Definitive diagnosis can be made by positive non-treponemal (Venereal Disease Research Laboratory [VDRL], Rapid Plasma Reagin [RPR]) and fluorescent treponemal antibody-absorption (FTA-ABS) tests; however, a VDRL may be negative if the infection is early. The organism may be identified by dark-field microscopy from lesions.

A CSF examination (opening pressure, cell count, total protein, glucose, and VDRL) is strongly recommended for all children and adolescents co-infected with HIV and syphilis.

Clinicians should perform a CSF examination in all infants with congenital syphilis born to mothers with HIV co-infection.

Treatment

Treatment of syphilis should be guided by the following factors: 1) the stage of syphilis, 2) whether it is congenital, 3) whether it is neurosyphilis, and 4) whether the patient is pregnant. For specific treatment and monitoring recommendations for syphilis, clinicians should refer to the Centers for Disease Control and Prevention's guidelines (www.cdc.gov/std/treatment).

Mycobacteria

Diagnosis

A presumptive diagnosis should be made if the patient presents with consistent clinical findings and has a positive purified protein derivative (PPD) test. Patients with HIV and severe immune suppression may be anergic.

Because acid-fast bacillus (AFB) smear and culture of the CSF are not very sensitive diagnostic tools, a strong effort should be made to obtain as much as 10 mL of CSF to increase the yield.

Treatment

Treatment of Mycobacterium tuberculosis CNS infection should begin immediately upon recognition of a positive smear or if other causes of meningitis are unlikely. Culture may be negative or may take several weeks to grow, and treatment should not be delayed.

Primary CNS Lymphoma

Diagnosis

CNS lymphoma should be suspected in the presence of focal neurologic deficits, seizures, or changes in mental status and when the computed tomography (CT) scan or magnetic resonance imaging (MRI) reveals a mass lesion.

Children with lymphoma detected outside the CNS should be vigorously assessed for possible intracranial involvement.

Lumbar puncture for Epstein-Barr virus PCR and cytology (assuming no evidence of mass effect on neuroimaging studies), and functional neuroimaging (SPECT scan) are non-invasive methods by which to diagnose lymphoma. A pediatric oncologist should be consulted.

In HIV-infected children, a brain biopsy may be necessary to confirm diagnosis of lymphoma.

Treatment

CNS irradiation and oral prednisone are treatments for lymphoma and may prolong survival.

### Antiretroviral (ARV) Toxicities

Suspected ARV-related neurologic disease in an HIV-infected child should be fully assessed and managed according to accepted pediatric neurology standards.

A child exposed to ARV drugs who develops seizures and psychomotor regression should be evaluated to exclude mitochondrial dysfunction by obtaining arterial and CSF lactate and pyruvate. Diagnostic confirmation requires muscle biopsy for immunohistochemistry and respiratory chain complex measures.

#### ARV-Associated Peripheral Neuropathy

Treatment

ARV-related neuropathy is often self-limited, and in mild cases should be treated with pain medications.

When ARV-related neuropathy is severe, the medication should be discontinued and replaced with another drug.

### HIV-Related Neuropathy/Myopathy/Myelopathy

#### HIV Polyneuropathy

Diagnosis

Clinical evaluation for HIV polyneuropathy (presumed to be unrelated to ARV therapy) should include an electromyogram, nerve conduction studies, lumbar puncture, and, depending on severity and type of neuropathy, a nerve biopsy.

Treatment

When warranted, treatment of demyelinating polyneuropathies is the same as that for inflammatory demyelinating polyneuropathies. Treatment should be given in consultation with a neurologist. Plasmapheresis and intravenous immunoglobulin are both efficacious for treating acute demyelinating polyneuropathies.

#### HIV Myopathy

Diagnosis

Diagnosis of HIV myopathy is made by clinical observations and evidence of myopathic changes on electromyogram. Mitochondrial myopathy can be diagnosed by muscle biopsy and respiratory chain assays.

Treatment

Discontinuation of a specific Nucleoside Reverse Transcriptase Inhibitor (NRTI) and its replacement with another ARV agent should be considered in patients with myopathy. Prednisone should be considered in patients with myopathy.

## HIV Myelopathy

Diagnosis

HIV myelopathy should be suspected in an HIV-infected child when spastic paraparesis (bilateral lower extremity hypertonia) without cognitive decline is the predominant neurologic finding.

MRI of the brain should be performed to exclude bilateral cerebral involvement mimicking spinal compromise.

## Seizures

As in non-HIV-infected children, electroencephalogram testing, in addition to an MRI scan and lumbar puncture, should be performed if indicated in the setting of seizures.

Simple febrile seizures (single, brief, generalized tonic-clonic seizure) with a clear source of infection do not warrant a lumbar puncture or electroencephalogram. A lumbar puncture to exclude meningitis or encephalitis should be performed in children with complex febrile seizures, or when there is any question about their mental status, neurological examination, or source of infection.

Patients with unprovoked afebrile seizures should be referred to a neurologist for seizure management.

## Stroke

Diagnosis

Strokes should be suspected with the onset of focal clinical signs, seizures, or changes in mental status. When a patient presents with these signs and symptoms, the clinician should consult with a pediatric neurologist.

MRI with diffusion weighted imaging is the most sensitive imaging technique available to identify strokes. An angiogram or angio-MRI may assist in determining the extent of vascular compromise.

Possible cause(s) for stroke (e.g., coagulopathy, neoplasia) should be identified, as well as whether the stroke is hemorrhagic or ischemic.

If subarachnoid hemorrhage occurs without obvious precipitating factors (i.e., trauma, neoplasia, coagulopathy), the rupture of an aneurysm should be suspected, and imaging tests should be obtained (angio-MRI, angiogram).

A neurosurgical consult should be obtained if intraparenchymal hemorrhage, especially with mass effect, or an aneurysm is found.

Hemorrhage is easily identified on a CT scan; however, in cases of ischemic, non-hemorrhagic (bland) strokes, CT images may be normal in the first 24 hours and may need to be repeated. The CT scan should be followed by an MRI with diffusion weighted imaging, which, if negative, excludes cerebral infarction.

Treatment

Subarachnoid hemorrhage should be managed by the consulting neurologist and neurosurgeon.

There is no specific drug treatment for HIV-related ischemic strokes. A rehabilitation medicine specialist should be consulted early in the course of a stroke.

All patients with subarachnoid hemorrhage should be monitored in intensive care, and neurological examination should be performed frequently with attention directed to changes in mental status.

Increased intracranial pressure should be treated as necessary.

### CLINICAL ALGORITHM(S)

None provided

## EVIDENCE SUPPORTING THE RECOMMENDATIONS

### TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The type of evidence supporting the recommendations is not stated.

## BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

### POTENTIAL BENEFITS

General to the Guidelines

Appropriate management of human immunodeficiency virus (HIV)-related neurological complications in children and adolescents

Specific Benefits of Highly Active Antiretroviral Therapy (HAART)

Prior to the introduction of highly active antiretroviral therapy (HAART) in 1996, the rates of neurologic dysfunction in children with symptomatic HIV infection were estimated to range from 30 to 50% for progressive encephalopathy and close to 90% for static encephalopathy. Since the advent of HAART, the rates of progressive encephalopathy found in clinical practice are much lower (approximately 5 to 10%). Because of early treatment and ongoing clinical monitoring, neurological symptoms are identified early and therefore tend to be less severe.

### POTENTIAL HARMS

#### Antiretroviral Drug Toxicity

See the "Major Recommendations" for a discussion of antiretroviral drug toxicity.

#### Major Toxicities That May Occur During or After Therapy for Cryptococcosis

- 5-fluorocytosine: marrow suppression, liver dysfunction, rash
- Amphotericin B: renal toxicity, hypokalemia, liver and bone marrow dysfunction, fever, hypotension, chills
- Fluconazole: liver dysfunction, rash

#### Major Toxicities That May Occur During or After Therapy for Toxoplasmosis

- Clindamycin: colitis, rashes
- Sulfonamides: rashes, hematuria, crystalluria, bone marrow suppression
- Pyrimethamine: bone marrow suppression, acts as a folic acid antagonist

## IMPLEMENTATION OF THE GUIDELINE

### DESCRIPTION OF IMPLEMENTATION STRATEGY

Following the development and dissemination of guidelines, the next crucial steps are adoption and implementation. Once practitioners become familiar with the content of guidelines, they can then consider how to change the ways in which they take care of their patients. This may involve changing systems that are part of the office or clinic in which they practice. Changes may be implemented rapidly, especially when clear outcomes have been demonstrated to result from the new practice such as prescribing new medication regimens. In other cases, such as diagnostic screening, or oral health delivery, however, barriers emerge which prevent effective implementation. Strategies to promote implementation, such as through quality of care monitoring or dissemination of best practices, are listed and illustrated in the companion document to the original guideline (HIV clinical practice guidelines, New York State Department of Health; 2003), which portrays New York's HIV Guidelines Program. The general implementation strategy is outlined below.

- Statement of purpose and goal to encourage adoption and implementation of guidelines into clinical practice by target audience

- Define target audience (providers, consumers, support service providers)

  Are there groups within this audience that need to be identified and approached with different strategies? (e.g., HIV Specialists, family practitioners, minority providers, professional groups, rural-based providers)

- Define implementation methods

  What are the best methods to reach these specific groups (e.g., performance measurement consumer materials, media, conferences)?

- Determine appropriate implementation processes
  - What steps need to be taken to make these activities happen?
  - What necessary processes are internal to the organization (e.g., coordination with colleagues, monitoring of activities)?
  - What necessary processes are external to the organization (e.g., meetings with external groups, conferences)?
  - Are there opinion leaders that can be identified from the target audience that can champion the topic and influence opinion?
- Monitor progress

  What is the flow of activities associated with the implementation process and which can be tracked to monitor the process?

- Evaluate
  - Did the processes and strategies work? Were the guidelines implemented?
  - What could be improved in future endeavors?

## INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

### IOM CARE NEED

Living with Illness

### IOM DOMAIN

Effectiveness

## IDENTIFYING INFORMATION AND AVAILABILITY

### BIBLIOGRAPHIC SOURCE(S)

New York State Department of Health. Neurologic complications in HIV-infected children and adolescents. New York (NY): New York State Department of Health; 2003 Mar. 19 p. [19 references]

### ADAPTATION

Not applicable: The guideline was not adapted from another source.

## DATE RELEASED

2003 Mar

## GUIDELINE DEVELOPER(S)

New York State Department of Health - State/Local Government Agency [U.S.]

## SOURCE(S) OF FUNDING

New York State Department of Health

## GUIDELINE COMMITTEE

Committee for the Care of Children and Adolescents with HIV Infection

## COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

Committee Chair: Joseph S. Cervia, MD, Director, The Comprehensive HIV Care and Research Center, Long Island Jewish Medical Center

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Committee Members: Elaine Abrams, MD, Director, Family Care Center, Department of Pediatrics, Harlem Hospital Center; Saroj Bakshi, MD, Chief, Division of Pediatric Infectious Diseases, Bronx-Lebanon Hospital Center; Howard J. Balbi, MD, Director, Pediatric Infectious Diseases and Pediatric AIDS Program, Nassau County Medical Center; Coleen K. Cunningham, MD, Associate Professor of Pediatrics, SUNY Upstate Medical University; Samuel Grubman, MD, Chief, Allergy and Immunology, Saint Vincents Catholic Medical Centers, St. Vincent's Manhattan; Sharon Nachman, MD, Chief, Pediatric Infectious Diseases, Associate Professor of Pediatrics, SUNY at Stony Brook. Department of Pediatrics; Catherine J. Painter, MD, PhD, Assistant Professor of Clinical Pediatrics, College of Physicians and Surgeons, Columbia University, Medical Director, Incarnation Children's Center; Vicki Peters, MD, Coordinator, Pediatric HIV Special Projects, Office of AIDS Surveillance, New York City Department of Health; Roberto Posada, MD, Assistant Professor of Pediatrics, Division of Pediatric Infectious Diseases, Director, Pediatric HIV Program, Mount Sinai School of Medicine; Barbara Warren, BSN, MPH, PNP, Assistant Bureau Director, Bureau of HIV Ambulatory Care Services, AIDS Institute, New York State Department of Health; Geoffrey A. Weinberg, MD, Director, Pediatric HIV Program, Associate Professor of Pediatrics, Department of Pediatrics, University of Rochester School of Medicine and Dentistry; Ed Handelsman, MD, Assistant Professor of Pediatrics, SUNY Health Sciences Center at Downstate, Assistant Medical Director of Pediatrics, Office of the Medical Director, AIDS Institute

## FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

## GUIDELINE STATUS

This is the current release of the guideline.

## GUIDELINE AVAILABILITY

Electronic copies: Available from the New York State Department of Health AIDS Institute Web site.

Print copies: Available from Office of the Medical Director, AIDS Institute, New York State Department of Health, 5 Penn Plaza, New York, NY 10001; Telephone: (212) 268-6108.

## AVAILABILITY OF COMPANION DOCUMENTS

The following are available:

- Neurologic complications in HIV-infected children and adolescents. Tables and recommendations. New York (NY): New York State Department of Health; 2003 Mar. 11 p.
- HIV clinical practice guidelines. New York (NY): New York State Department of Health; 2003. 36 p.

Electronic copies: Available from the New York State Department of Health AIDS Institute Web site.

Print copies: Available from Office of the Medical Director, AIDS Institute, New York State Department of Health, 5 Penn Plaza, New York, NY 10001; Telephone: (212) 268-6108.

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